TETHYS BLAST

23 August 2019

The bi-weekly *Tethys* Blast highlights new information on *Tethys*, news articles of international interest, and opportunities in wind and marine renewable energy. We hope you find this a valuable tool to keep you connected to colleagues, new research, opportunities, and industry milestones.

Upcoming Events at EWTEC 2019

PRIMRE Side Event

> You are invited to join a PRIMRE (Portal and Repository for Information on Marine Renewable Energy) side event on Monday, 2 September 2019 from 17:30 to 19:00 CEST as part of the European Wave and Tidal Energy Conference (EWTEC) in Napoli, Italy. The purpose of the side event is to provide an overview of PRIMRE and the main knowledge hubs that are supported within PRIMRE: MHK Data Repository, *Tethys*, and *Tethys Engineering*. You can find more information on the side event here or register for it by registering for the conference here.

Powering the Blue Economy Side Event

> You are invited to join a Powering the Blue Economy side event on Tuesday, 3 September 2019 from 17:30 to 19:00 CEST as part of the EWTEC in Napoli, Italy. The event will feature a panel discussion on wave energy powered microgrids. You can find more information on the side event here.

Risk Retirement Workshop

> OES-Environmental and ORJIP invite you to join a workshop on Thursday, 5 September 2019 from 14:30 to 17:30 CEST on retiring risks of effects on marine animals from electromagnetic fields and underwater noise from marine energy devices. The workshop will be held at the Centro Congressi della Stazione Marittima di Napoli, following the EWTEC. You can register for the workshop by sending an email to ORJIP (ORJIP@aquatera.co.uk). You can find more information here.

Upcoming Risk Retirement Workshop at OREC

OES-Environmental invites you to join a workshop on 11 September 2019 from 8 a.m. to 10 a.m. PDT on retiring risks of effects on marine animals from underwater noise from marine energy devices. The workshop will be held in conjunction with the Ocean Renewable Energy Conference (OREC) in Portland, Oregon. You can find more information on the workshop here or register for it by registering for the conference here.

Tethys Engineering Webinar Recording Available

Tethys hosted a webinar on 7 August 2019 which introduced *Tethys Engineering*, a new website that covers the technical and engineering aspects of marine renewable energy. A recording of the presentation is now available on *Tethys.*

Marine Energy Collegiate Competition Announcement

The U.S. Department of Energy's National Renewable Energy Laboratory (NREL) has launched the Marine Energy Collegiate Competition: Powering the Blue Economy to provide hands-on experience to students preparing for a career in renewable energy. NREL will be holding an informational webinar on 29 August 2019 at 12 p.m. ET, after which, teams will be able to submit their application until 18 October 2019.

Job Announcement

NREL is seeking a Wind-Wildlife Researcher III to contribute to programs and projects that focus on monitoring and minimizing impacts to avian wildlife from renewable energy development.

Enel Renewables Challenge Announcement

In coordination with Greentown Labs, the Enel Boston Innovation Hub recently announced the Enel Renewables Challenge and is seeking to connect with startups working to improve renewable technologies. Applications can be found here and are due 20 September 2019.

Upcoming Summit

SeaAhead's inaugural Global Bluetech Summit will be held on 9-10 October 2019 in New York City, bringing together hundreds of high-level stakeholders to talk about the intersection of ocean innovation and finance. This year's theme, "Next Generation Bluetech," will organize the event around forward-looking strategies and new paradigms of innovation where technology meets the ocean. Register for the event here.

New Documents on *Tethys*

New documents are regularly added to *Tethys*, hand-selected for their relevance to the environmental effects of wind and marine renewable energy. Short excerpts from new or popular documents are listed below, accessible by the accompanying *Tethys* links:

Potential effects of deep seawater discharge by an Ocean Thermal Energy Conversion plant on the marine microorganisms in oligotrophic waters – Giraud et al. 2019

> Installation of an Ocean Thermal Energy Conversion pilot plant (OTEC) off the Caribbean coast of Martinique is expected to use approximately 100,000 m^3h^{-1} of deep seawater for its functioning. This study examined the potential effects of the cold nutrient-rich deep seawater discharge on the phytoplankton community living in the surface warm oligotrophic waters before the installation of the pilot plant. The thermal effect should be limited, <1 km^2 on the area exhibited a temperature difference of 0.3°C, producing a negligible thermic impact on the phytoplankton assemblage.

Interference of Flying Insects and Wind Parks – Trieb 2018

> The study investigates possible coherence of flying insect losses recently discovered in Germany and insect impingement on the rotor blades of wind turbines. Model calculation of the amount of insect biomass that traverses wind rotors during operation provides a first estimate of the order of magnitude of 24,000 tons of insects crossing the German wind park throughout the summer season. Based on conservative model assumptions, five percent of the insects flying through a rotor could be actually damaged.

3D modelling of the impacts of in-stream horizontal-axis Tidal Energy Converters (TECs) on offshore sandbank dynamics – Chatzirodou et al. 2019

> Energy developers' interests are progressing towards the deployment of large arrays of tidal energy converters (TECs). This study investigated the impacts of tidal energy extraction from a large array of TECs on the sediment dynamics and morphology of these sandbanks. A large-scale 3D hydrodynamic and morphodynamic Delft3D model was set up to computationally model Pentland Firth, Inner Sound Channel in order to study the impacts of tidal energy extraction from a generic TEC array, on the existing hydrodynamic and morphodynamic regime.

Upscaling positive effects of scour protection in offshore wind farms – Coolen et al. 2019

> The introduction of artificial hard substrates by placing wind turbine foundations and scour protection facilitates epibenthic species and associated benthic fish. The addition of rocks could be considered as adding H1170 habitat ('Reefs of open sea') and as such has a positive impact on hard substrate associated benthic macrofauna and fish. The significance of this effect, however, is unclear on a scale outside the scour protection. This report describes the result of a quick-scan in which the significance of this positive effect is quantified.

Full life cycle assessment of two surge wave energy converters – Karan et al. 2019

> The aim of this study was to identify the environmental impacts of the deployment of the Oyster wave energy converter to the EMEC test site at Orkney, UK over its lifetime across three general categories: resource use, human health and ecological consequences. A full life cycle assessment was performed on two different models of the Oyster wave energy converter: Oyster 1 and Oyster 800. Key sustainability indicators for energy converters include carbon footprint and energy payback period, and these were found to be 79 and 57 gCO2 eq/kWh and 45 and 42 months for the Oyster 1 and Oyster 800.

The legislative regime for environment assessment and approval of offshore wind energy developments in England and Wales – Wawryk 2018

> This article will examine and critically assess the regime for environmental assessment and approval of offshore wind energy projects in England and Wales. It will begin by giving an overview of the broader framework for the location and selection of sites for offshore wind energy facilities, including the role of Strategic Environmental Assessment, the establishment of zones for development, procedures for obtaining tenure over the sea bed, and non-mandatory procedures for environmental assessment at the zone level.

News and Current Events

Marine Renewable Energy

Minesto resumes DG500 kite system operations – Minesto

> Leading marine energy developer Minesto has resumed testing of its commercial-scale DG500 kite system at the company's Holyhead Deep site off North Wales. Following the recent re-installation of some of the offshore site infrastructure in the Holyhead Deep, the DG500 kite system was towed to site where the kite was re-connected to the seabed foundation. The operations this year build on last year's commissioning program, especially looking at long-term operations. This will be used for optimisation and cost reduction of Minesto's unique Deep Green technology.

Energy Department Funding Helps Transform Alaskan River into Renewable Energy Source – U.S. Department of Energy

> In June 2019, the tiny southwestern Alaska village of Igiugig became the first U.S. tribal entity to receive a Federal Energy Regulatory Commission permit for a water-powered project not connected to a dam. A month later, on July 16, Igiugig Village launched a unique, 35-kilowatt water power system that will transform the mighty Kvichak River into a renewable energy source that could provide up to half of the community's electricity and greatly reduce its dependency on costly diesel fuel.

Mocean Energy selects C-GEN technology for wave power take-off – Mocean Energy

Wave energy pioneers Mocean Energy have selected the University of Edinburgh's C-GEN technology to provide the power take-off (PTO) for their first half-scale wave energy prototype. In January this year Mocean Energy secured £3.3 million from Wave Energy Scotland to develop and build a scale prototype of their Blue Horizon wave machine which will be deployed in Orkney next year. The two teams will now build a test rig, which will be tested at a specialist facility in Rosyth, where they can put the C-GEN PTO through performance and acceptance testing using representative wave data.

RESOURCECODE to Develop Marine Data Toolbox for Energy Sector – EMEC

A new project, funded by Ocean Energy Era-Net Cofund, has been launched to support investment and growth in the wave and tidal energy sector through the creation of an integrated marine data toolbox. The RESOURCECODE project brings together the European Marine Energy Centre (EMEC), Ifremer, Ocean Data Lab, SmartBay Ireland, Centrale Nantes, University College Dublin, University of Edinburgh and INNOSEA. The RESOURCODE Marine Data Toolbox will integrate high-resolution hindcast dataset and analysis tools in a common online platform enabling easy access and analysis.

OPT PB3 PowerBuoy Set for North Sea Debut – Marine Energy

Ocean Power Technologies, in partnership with the Acteon Group, has recently unveiled the PB3 PowerBuoy in Montrose – prior to its demonstration in the North Sea on Premier's Huntington field. The project, supported by the OGTC and Premier Oil, is PB3 PowerBuoy's first-of-its-kind deployment in the North Sea, whereby a moored buoy captures power from the motion of ocean waves to allow it to provide monitoring capabilities and protect subsea architecture.

Wind Energy

World's Longest Wind Turbine Blade Reached UK – Marine Link

The world's longest offshore wind turbine blade has arrived in Northumberland, UK to be tested at the Offshore Renewable Energy Catapult site. The 107-metre blade will be used on the most powerful wind turbine in commercial development – the 12MW Haliade-X from GE Renewable Energy. The blade will undergo a full range of advanced testing procedures, demonstrating its ability to withstand peak wind conditions and simulating its readiness for years of operation at sea. Three other 107 metre blades will soon be shipped to a prototype site in Rotterdam, The Netherlands.

Makani and Shell run offshore kite tests - reNEWS

US outfit Makani has completed two test flights of its energy kite from a floating foundation off Norway. The tests were completed in conjunction with Shell at Norway's Metcentre in early August, where the kite was flown from a spar buoy foundation in

water depths of 220 metres. The first test flight included a launch, hover away from the perch and an autonomous landing, Makani said. The second flight was a longer duration test where the kite flew in crosswinds and ended with the loss of the energy kite, which did not successfully land on the platform.

Equinor and AMS Unveil Autonomous OW Survey Vessel – Offshore Wind

Equinor and Autonomous Marine Systems Inc. (AMS) have launched the first-ever autonomous sailing platform for offshore wind surveys. The Datamaran is a 16-foot wind and solar-powered system which carries a LiDAR to collect data on wind and weather conditions at remote offshore wind lease areas. It underwent several years of testing and is now ready for commercial deployment as an autonomous platform for wind resource assessments. The Datamaran reduces the cost of gathering crucial data for the development of offshore wind projects, Equinor said.

New York Power Authority Releases Report on Learnings from European Wind Projects That Will Help Guide U.S. Offshore Wind Development – NYPA

The New York Power Authority (NYPA) shared key learnings from a study of European offshore wind transmission models that will help guide New York State as it moves aggressively towards its 9 gigawatt (GW) offshore wind goal by 2035 and inform regional and national offshore wind development. The report, commissioned by NYPA and its New York State energy partners, identified healthy competition and scaling up generation and transmission assets as key to building New York's offshore wind capacity and meeting the state's renewable energy goals.

China's Goldwind, Canada's Potentia claim "world-record" wind price – Smart Energy International

Chinese wind turbine manufacturer Goldwind has secured it's first order in Canada at what it claims is a "world-record low price for long-term wind energy contracts." The 200MW Golden South Wind project in Assiniboia, in the country's Saskatchewan province, by Potentia Renewables, will be outfitted with 50 of Goldwind's 4MW platform-direct-drive machines. Potentia is set to develop 625MW of wind capacity at sites in the western half of the country over the next few years, the first of which is the Golden South project, according to a statement.

ORJIP Ocean Energy is a UK-wide collaborative programme of environmental research with the aim of reducing consenting risks for wave, tidal stream, and tidal range projects. Partnering with Annex IV, ORJIP provides content input to *Tethys* Blasts and wishes to make you aware of the following opportunities:

- The 4th MaRINET2 Transitional Access Call for offshore renewable testing is open until 30 September 2019. The project offers free access to a world-leading network of testing and research infrastructures, including EMEC's test sites, and is open to offshore wind, wave, and tidal energy technology developers. An informational webinar will be held on 28 August 2019 at 10 a.m. BST to provide applicants with guidance on the application process, including recent updates to the online portal.